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EXAMINER
NORTON, JENNIFER L

ART UNIT	PAPER NUMBER
2121	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/605,074	TOUZOV, IGOR V.	
	Examiner	Art Unit	
	Jennifer L. Norton	2121	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *6 September 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4 and 6-20* is/are rejected.

7)☒ Claim(s) *5* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 September 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 9/6/03
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-20 are pending in this application.

Oath/Declaration

2. A new oath was received on 21 October 2005. The new oath is acceptable.

Drawings

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: Fig. 2, elements 105-109 and 111-112, these reference elements are indicated in the description, but do not include reference labels to adequately support the drawings to allow the examiner to properly comprehend the contents of the drawing. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the

applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

4. The disclosure is objected to because of the following informalities:

The abbreviation "LTI" (pg. 1, par. [0009]) is not defined. All abbreviations should be defined in the specification to avoid any question of ambiguity.

Appropriate correction is required.

Claim Objections

5. Claim 2 is objected to because of the following informalities:

Claim 2 includes a ";" at the end of the sentence, which should be replaced with a ".". Appropriate correction is required.

6. Claim 5 is objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim because it does not refer back in the alternative only. Claim 5 refers to claim 4 and claims 1 or 3. See MPEP § 608.01(n). Accordingly, the claim has not been further treated on the merits.

7. Claims 10-13 are objected to because of the following informalities:

Claims 10-13 include "or" misspelled as "ore".

Appropriate correction is required.

8. Claims 17-20 are objected to because of the following informalities:

Claims 17-20 include the typographical error, [Claim Reference]" multiple times preceding each claim; every "[Claim Reference]" should be deleted.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

9. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

10. Claim 9 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The term "priory" is not disclosed in the written description.

11. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

12. Claims 17-20 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the

steps. See MPEP § 2172.01. The omitted steps are those pertaining to the specific method of multiple input multiple output system identification.

13. Claim 17-20 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements are those incorporated and make-up the structure of the "apparatus" of claims 17-20.

Claim Rejections - 35 USC § 101

14. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

15. Claim 1 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The recursive validation and repetitive update of the system response model in the disclosed application, given it broadest reasonable interpretation consistent with the specifications, is considered to include mathematical algorithms that have not been incorporated into any computer readable medium to produce a useful, concrete, and tangible result. Claim 2 appears to be directed to an abstract idea and process of tuning a model rather than a practical application of the process.

16. Claim 2 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The detection and classification of changes in the system response model in the disclosed application, given it broadest reasonable interpretation consistent with the specifications, is considered to include mathematical algorithms that have not been incorporated into any computer readable medium to produce a useful, concrete, and tangible result. Claim 2 appears to be directed to an abstract idea and process to detect and classify changes of a model rather than a practical application of the process.

17. Claim 3 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The dynamic refinement/revalidation of the system response model in the disclosed application, given it broadest reasonable interpretation consistent with the specifications, is considered to include mathematical algorithms that have not been incorporated into any computer readable medium to produce a useful, concrete, and tangible result. Claim 3 appears to be directed to an abstract idea and process of tuning a model rather than a practical application of the process.

18. Claim 4 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The detection of hysteresis and use of input data in the system response model in the disclosed application, given it broadest reasonable interpretation consistent with the specifications, is considered to include mathematical

algorithms that have not been incorporated into any computer readable medium to produce a useful, concrete, and tangible result. Claim 4 appears to be directed to an abstract idea and process of tuning a model rather than a practical application of the process.

19. Claim 5 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The detection of hysteresis of the system response model in the disclosed application, given it broadest reasonable interpretation consistent with the specifications, is considered to include mathematical algorithms that have not been incorporated into any computer readable medium to produce a useful, concrete, and tangible result. Claim 5 appears to be directed to an abstract idea and process of tuning a model rather than a practical application of the process.

20. Claim 6 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. A matrix representation of constraints in the system response model in the disclosed application, given it broadest reasonable interpretation consistent with the specifications, is considered to include mathematical algorithms that have not been incorporated into any computer readable medium to produce a useful, concrete, and tangible result. Claim 6 appears to be directed to an abstract idea and process of tuning a model rather than a practical application of the process.

21. Claim 7 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Linear model association with trajectory changes in the system response model in the disclosed application, given it broadest reasonable interpretation consistent with the specifications, is considered to include mathematical algorithms that have not been incorporated into any computer readable medium to produce a useful, concrete, and tangible result. Claim 7 appears to be directed to an abstract idea and process of tuning a model rather than a practical application of the process.

22. Claim 8 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Linear model association with trajectory changes and direction, and dynamic construction or refinement in the system response model in the disclosed application, given it broadest reasonable interpretation consistent with the specifications, is considered to include mathematical algorithms that have not been incorporated into any computer readable medium to produce a useful, concrete, and tangible result. Claim 8 appears to be directed to an abstract idea and process of tuning a model rather than a practical application of the process.

23. Claim 9 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Optimization of the system response model in the disclosed application, given it broadest reasonable interpretation consistent with the

specifications, is considered to include mathematical algorithms that have not been incorporated into any computer readable medium to produce a useful, concrete, and tangible result. Claim 9 appears to be directed to an abstract idea and process of tuning a model rather than a practical application of the process.

24. Claims 10-16 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The high/low level software language in the disclosed application do not define any structural and functional interrelationships between the computer program and other claimed limitations which permit the computer program's functionality to be realized to produce a useful, concrete, and tangible result.

25. Claims 17-20 are rejected under 35 U.S.C. 101 because the claimed invention is not supported by either a specific and substantial asserted utility or a well established utility.

Claims 17-20 disclose an apparatus incorporated in digital processing device without disclosing enough information about the invention to make its usefulness immediately apparent to those familiar with the technological field of the invention.

Claims 17-20 are also rejected under 35 U.S.C. 112, first paragraph. Specifically, since the claimed invention is not supported by either a specific and substantial

asserted utility or a well established utility for the reasons set forth above, one skilled in the art clearly would not know how to use the claimed invention.

Claim Rejections - 35 USC § 102

26. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

27. Claim 2 is rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent Publication No. 200/0158828 (hereinafter Ikeda).

28. As per claim 2, Ikeda discloses a method of multiple input multiple output system identification that utilizes dynamic construction of system response model and contains following steps:

clustering analysis of the model during updates that identifies statistically significant changes in the model over specific bands of adjustable frequencies (pg. 3, par. [0027]-[0028] and pgs. 5, par. [0053]);

split of the model onto several models associated with individual clusters and invalidation of bands of allowable frequencies on which clustering was detected (pg. 3, par. [0027]-[0028] and pgs. 5, par. [0054]).

29. Claim 6-7, 13-14 and 17-20 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent Publication No. 2003/0028266 (hereinafter Jacques).

30. As per clam 6, Jacques discloses a method of identification of multiple input multiple output system (pg. 3, par. [0028]) that dynamically constructs system model which incorporates input-input dependency and output-output dependency (pg. 5-6, par. [0049]-[0050]) and at some state can be represented in matrix form as

g (t) = [g 0 ((I - g 0) ^- 1) g 1

((I - g 3) ^- 1) g 2 g 3] , where g.sub.0 and g.sub.3 are square matrixes (pg. 6, par. 0051]).

31. As per claim 7, Jacques discloses a method of identification of a steady state among multiple possible steady states of multiple input multiple output system (pg. 3, par. [0028]) that invokes the model of the system according to claim 6 dependency (pg. 5-6, par. [0049]-[0051]) and includes step of matching vector of function or vector of time series to one of existing system response matrix, wherein said vector composed of inputs and outputs of the system and said matrix is structured according to claim 6

and matching process involves convolution or product of said matrix an vector (pg. 6, par. [0052]).

32. As per claim 13, Jacques discloses a digital algorithm implementing method of claim 6 that realized as high-level software language or low level binary code (pg. 3, par. [0028]) and aided for execution on two ore more digital processing devices (pg. 3-4, par. [0029]).

33. As per claim 14, Jacques discloses a digital algorithm implementing method of claim 7 that realized as high-level software language or low level binary code (pg. 3, par. [0028]) and aided for execution on two or more digital processing devices (pg. 3-4, par. [0029]).

34. As per claim 17, Jacques discloses an apparatus incorporating only single digital processing device and at least one method of this invention and said apparatus operating as close-loop feedback controller only (pgs. 3-4, par. [0029]).

35. As per claim 18, Jacques discloses an apparatus incorporating only single digital processing device (pgs. 3-4, par. [0029]) and at least one method of this invention and said apparatus operating as open-loop or feed-forward controller only (pg. 3, par. [0028]).

36. As per claim 19, Jacques discloses an apparatus incorporating multiple single digital processing devices and at least one method of this invention and said apparatus operating as close-loop feedback controller only (pgs. 3-4, par. [0029]).

37. As per claim 20, Jacques discloses an apparatus incorporating multiple single digital processing devices (pgs. 3-4, par. [0029]) and at least one method of this invention and said apparatus operating as open-loop or feed-forward controller only (pg. 3, par. [0028]).

38. Claims 9 and 16 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,947,876 (hereinafter Galarza).

39. As per claim 9, Galarza discloses a method of open-loop or close-loop feedback control of multiple input multiple output system that utilizes dynamically constructed optimal control solutions for control inputs of said system and wherein each said solution is created for specific steady state of the system and for specific values of constraints imposed on the system and said control and said method includes following steps:

a priory creation of plurality of optimal solutions for control inputs (col. 7, lines 52-60);

real-time lookup of optimal solution based on current steady state of the system and closest match of current functions of inputs and outputs of said system to values of a priory selected constraints and where said lookup may be accelerated by means of a priory indexing or ordering of said constraints (col. 7, lines 61-67 and col. 8, lines 1-2).

40. As per claim 16, Galarza discloses a digital algorithm implementing method of claim 9 that realized as high-level software language or low level binary code (col. 3, lines 52-67) and aided for execution on two or more digital processing devices (col. 3, lines 36-41).

Claim Rejections - 35 USC § 103

41. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

42. Claim 1, 3 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Non-Patent Literature Publication Model Validation and Uncertainty (hereinafter Xu) in view of Jacques.

43. As per claim 1, Xu teaches a method of system identification that utilizes dynamic construction of system response model and contains following steps:

recursive validation of the model accuracy on dynamically adjustable bands of allowable frequencies (pg. 1291, abstract, pg. 1292, Computing the Uncertainty of Parameter and pg. 1293, Reasonable Model Validation);

Xu does not expressly teach repetitive update of the model at dynamically selected bands of allowable frequencies.

Jacques teaches repetitive update of the multi input/multi output model (pg. 3, par. [0028]) at dynamically selected bands of allowable frequencies (pg. 4-5, par. [0041]-[0043]).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to include the multi input/multi output model at dynamically selected bands of allowable frequencies to continuously update initial model parameters, so to enable optimum performance for maximizing output, but requiring minimal additional hardware (pg. 1, par. [0005] and pg. 3, par. [0018]).

44. As per claim 3, Xu as set forth above teaches a method of output system identification that utilizes dynamic revalidation of system response model and said method contains steps of claims 1.

Xu does not expressly teach a dynamic revalidation is invoked during normal operations of said system.

Jacques teaches a dynamic revalidation is invoked during normal operations of said system and said method contains steps of claim 1 (pg. 3, par. [0019]).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to include the multi input/multi output system utilizes dynamic revalidation during normal operations to continuously update initial model parameters, so to enable optimum performance for maximizing output, but requiring minimal additional hardware (pg. 1, par. [0005] and pg. 3, par. [0018]).

45. As per claim 10, Xu teaches to a digital algorithm implementing as set forth in claim 1 that realized as low level binary code (pg. 1292, Computing the Uncertainty of Parameter).

Xu does not teach the execution software/code on two ore more digital processing devices.

Jacques teaches to the execution of software/code on two ore more digital processing devices (pg. 3-4, par. [0029]).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to include the execution of low level binary code on two ore more digital processing devices to continuously update initial model parameters, so to enable optimum performance for maximizing output, but requiring minimal additional hardware (pg. 1, par. [0005] and pg. 3, par. [0018]).

46. Claim 3 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ikeda in view of Jacques.

47. As per claim 3, Ikeda teaches to a method of output system identification that utilizes dynamic refinement of system response model (pg. 3, par. [0027]-[0028] and pgs. 5, par. [0053]).

Ikeda does not expressly teach dynamic refinement is invoked during normal operations of said system and said method contains steps of claims 1 or 2.

Jacques teaches a dynamic refinement is invoked during normal operations of said system and said method contains steps of claim 1 (pg. 3, par. [0019]).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to include the multi input/multi output system utilizes dynamic refinement during normal operations to continuously update initial model parameters, so to enable optimum performance for maximizing output, but requiring minimal additional hardware (pg. 1, par. [0005] and pg. 3, par. [0018]).

48. As per claim 11, Ikeda teaches to a digital algorithm implementing method of claim 2 that realized as high-level software language or low level binary code

Ikeda does not expressly teach execution of software/code on two ore more digital processing devices.

Jacques teaches to the execution of software/code on two ore more digital processing devices (pg. 3-4, par. [0029]).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to include the execution of low level binary code on

two ore more digital processing devices to continuously update initial model parameters, so to enable optimum performance for maximizing output, but requiring minimal additional hardware (pg. 1, par. [0005] and pg. 3, par. [0018]).

49. Claim 4, 8, 12 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacques in view of U.S. Patent No. 6,920,378 (hereinafter Eloundou).

50. As per claim 4, Jacques teaches a method of multiple input multiple output system identification (pg. 3, par. [0028]) that utilizes dynamic construction of system response model and said model is accounting for possible hysteresis in the system and identification steps involve repetitive use of control inputs (pgs. 5-6, par. [0049]-[0050]) and pg. 6, par. [0059]).

Eloundou teaches to control input shapes are defined as a functions with wide-band frequency spectrum and either infinitely piecewise smooth or having k piecewise continuous derivatives (col. 2, lines 41-46 and col. 4, lines 61-63).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to include control input shapes are defined as a functions with wide-band frequency spectrum and either infinitely piecewise smooth or having k piecewise continuous derivatives to cause the physical system to move

according to the motion command while minimizing unwanted dynamics in the physical system (col. 2, lines 47-56).

51. As per claim 8, Jacques as set forth above teaches a method of open-loop or close-loop feedback control of multiple input multiple output system that utilizes dynamically constructed or dynamically refined model that comprises plurality of linear models (pg. 3, par. [0028]) and wherein said linear models have identified associations with trajectory of changes of control inputs of said system and direction of following said trajectory, and wherein said dynamic construction or refinement as set forth in claim 4 (pg. 4, par. [0032]-[0038]).

52. As per claim 12, Jacques as set forth above teaches a digital algorithm implementing method of claim 4 that realized as high-level software language or low level binary code (pg. 3, par. [0028]) and aided for execution on two ore more digital processing devices (pg. 3-4, par. [0029]).

53. As per claim 15, Jacques as set forth above teaches an digital algorithm implementing method of claim 8 that realized as high-level software language or low level binary code (pg. 3, par. [0028]) and aided for execution on two or more digital processing devices (pg. 3-4, par. [0029]).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following references are cited to further show the state of the art with respect to signal detection.

U.S. Patent Publication No. 2002/0070796 discloses a multi-standard channel decoder for digital systems.

U.S. Patent No 6,732,064 discloses a signal and classification technique that provides decision criteria for parameters and signals in the presence of noise and interfering signals.

U.S. Patent No. 2004/0088060 discloses a method and system of designing operations and controls of a gas turbine.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer L. Norton whose telephone number is 571-272-3694. The examiner can normally be reached on 8:00 a.m. - 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anthony Knight can be reached on 571-272-3687. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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